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by Muhammad Asnawi Kamil

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Picture Dictionary Mobile Application with Text Pronunciation

by

Muhammad Asnawi bin Kamil

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Dissertation submitted in partial fulfillment

of the requirement for the

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CERTIFICATION OF APPROVAL

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A project dissertation submitted to the

Information Technology Programme

Universiti Teknologi PETRONAS

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Approved by,

_____

Saipunidzam Mahamad

UNIVERSITI TEKNOLOGI PETRONAS

TRONOH, PERAK

MAY 2015

CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that original work contained herein have not been undertaken or done by unspecified sources or persons.

_____

Muhammad Asnawi bin Kamil

ACKNOWLEDGEMENT

First of all, I would like to express my deepest gratitude to my supervisor, Saipunidzam Mahamad, in providing me advices and assistance in completing the system. His advice and guidance has been a great help in completing this final year project. Frequent meeting has been done to monitor my projects progress and to provide guidance in enhancing my application.

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Lastly, I would like to thank my fellow respondents who have sacrificed some of their time to answer my questionnaire forms. The information and requirements obtained has been a great help in the development of my picture dictionary mobile application.

ABSTRACT

In Malaysia, lower primary school students have been using the picture dictionary as the guide to learn objects in multiple languages such as Malay, English, Chinese and Tamil. Not only that, teachers also have been using it as a material to assist them in teaching language subjects. Some of the learning activities that involved the usage of picture is dictionary in school is sentence construction, vocabulary learning, arts drawing, and crucial activity such as oral assessment. Not only that, students also have been using picture as a source of exploring and discovering new things. However, the picture dictionary is lacking few things which can be improved with an introduction of an application which is called picture dictionary mobile application with text pronunciation. Traditional picture dictionary can be really heavy for children to carry. Not only that, it does not allow children to search the object they want easily in the dictionary. Lastly, even though it teaches student what certain objects are called in other languages, it does not teach them on how to pronounce the word correctly.

In this project, the first objective is to study what is picture dictionary and to analyze the importance of picture dictionary. Fifty questionnaire forms were done and distributed to two schools which are Sekolah Kebangsaan Tronoh and Sekolah Kebangsaan Seri Tronoh. Questions were also asked to collect information about the picture dictionary mobile application that is going to be developed. At the end of the research, it was found that the responses are convincing that picture dictionary mobile application is a good application to be developed in assisting in lower primary school students learning. This leads to the primary objective, which is to develop a picture dictionary mobile application which can assist lower primary school children in learning languages such as Malay, English, Chinese and Tamil.

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

Mobile learning is currently a trending type of learning which started to be commonly used by children and teenagers. It can be defined as any educational provision where the technologies involved are handheld. The criteria which must be involved for it to be considered mobile learning are mobility of technology, learning and learners. [1] Some examples of the technology are mobile phones and tablets. Mobile learning is currently a huge increase which uses many portable devices such as phones, tablets and laptops to serve at anywhere and anytime. [3] Since primary school nowadays can get a hold of mobile phones and tablet, it is a great opportunity to develop a software which can help them learn about things in other language. This could be very helpful when the students wants to write essays in schools. Not only that, the students also has the opportunity to learn more things such as and their appearance nature, behavior, habitats and other relevant information through the picture.

With the development of this application, it will help primary school students to further learn about many things that exist in the world in other language and allow them to apply to writing essays or other academic related activity.

1.2 Problem Statement

Other than picture dictionary, text books and work books, primary school students do not have any other alternative to learn about basic words in other languages. Most of the dictionaries are for older student which use a high level language to explain the object. The book picture dictionary is also can be heavy and put an extra weight in their bag. Not only that, the students may lose interest easily especially when the dictionary are just plain wall of text.

With the development of this application, primary school students are more interested in learning when the dictionary also includes attractive and eye-catching pictures along with easy to understand definitions compared to general dictionary. Not only that, the concept of mobile learning allows the students to learn anywhere and at any time.

Besides that, the dictionary also provides some exercises which are related to the category of the dictionary. This also allow the students to manipulate and apply what they understand about certain words in the dictionary. Due to this, the students can easily remember what they have learned in the dictionary.

1.3 Objectives

- To develop a picture dictionary mobile application to assist lower primary school students in learning other local languages.
- To integrate the text pronunciation and search function in the picture dictionary mobile application.

1.4 Scope of Study

- The scope of study is mainly focused on and lower primary school students which are from standard one to standard three.
- The mobile children picture dictionary will have several general categories such as mammals, vehicles, fruits and electronics.
- The languages will be from Malay to English, Chinese and Tamil.
- The mobile dictionary will be based on smart phones and tablets.

1.5 Feasibility Study

2.5.1 Technology Feasibility

The technology used to create this mobile app is called MIT App Inventor. This is an online website-based android development tool used to create android applications. The development is simple, however, great knowledge of programming algorithm is needed.

2.5.2 Operational Feasibility

The target of the mobile application will be mainly on lower primary school students which are from Standard 1 until Standard 3. It can also be used for all ages implying if they want to learn in other languages. The mobile picture dictionary can be used as a guideline and learning tool for studying languages such as English, Malay, Chinese and Tamil. It will be fully operated in android mobile technologies such as mobile phones and tablets.

2.5.3 Economic Feasibility

The cost for the application development is economical because the tools required to create the app which is the MIT App Inventor is free.

2.5.4 Schedule Feasibility

The expected time line to complete this project is approximately four months for the development. In that duration, the development will cover things such as information retrieving from the picture dictionary, sounds, pictures and animations. The activities will proceed just like what is scheduled in the Gantt chart. A test is done to ensure that there is no errors in the developed mobile application with the users.

CHAPTER 2

LITERATURE REVIEW

2.1 What is a picture dictionary?

Picture dictionary is a dictionary which defines words in the forms of drawing or a picture. The sole reason for this picture is to easily teach learners on how does certain words looks like. The picture of the word helps in depicting the appearance, the colors, the size or even the behavior of the word itself. Not only that, it also help learners learn the word in their native language and other language. [2]

The picture dictionary is mostly tailored for younger children since drawing and pictures really helps in keeping their interest in learning. Not only that, picture also helps more in memorizing information easily. Since the dictionary itself contains word from other language which is unusual to the children, the drawing can really help the children learn and remember the word itself.

2.2 The needs of picture and drawings in dictionary.

The reason why some dictionaries have pictures is to help learners to understand the definition in the form of drawings and pictures. [2] This is very helpful since the drawings or pictures can explain many things such as the shape, appearances and even the behavior of animals or people in the drawings. Young children may have not yet seen certain things in real life. Therefore, it is very nice for children to learn about it in the dictionary.

Not only that, picture and drawings really helps in children learning especially in memorizing information. Memorization can be a really useful foundation which allow us to build a strong foundation of life for us to plan for the future. Childhood is the age where memory is very effective since there is so much new information to learn and sustain especially in educational environment. A research has stated that the children which has gone through learning process with a drawn picture tend to be able to recall the information learned more accurately compared to the ones who learned solely on verbal.[4] With this fact, we can see that the picture dictionary is really indeed effective for children.

2.3 Language learning in mobile learning

Mobile learning is currently can be considered at its tipping point. Tipping point basically means that it started to become trending among people. In this case, mobile learning among young children such as the primary school students started to spread like an epidemic. It's basically an idea which tell us that mobile learning is very efficient in our daily lives. [3]

At first, mobile learning was focused on the role of mobile technology in education. After many years, mobile learning is now focusing on the mobility of the users and informal education that happens out of class. One of the device that is commonly used for mobile learning is the mobile phones. It has been proven that mobile phones helps in leveraging instruction, strengthen your learning based on your location, and improves learning. [1]

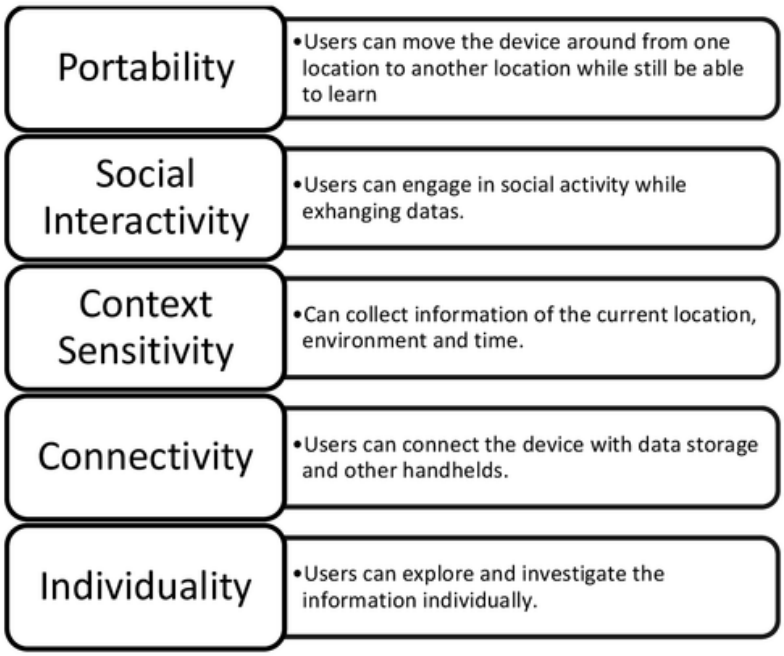


Figure 2.3: Capabilities of a smart phone in mobile learning [1]

Research has been done that students tend to use mobile phones more in learning. It can improve students' personal and academic needs and better learn subjects in school. [1]

Mobile Assisted Language Learning (MALL) is a type of language learning which uses mobile technologies. Mobile technologies are very effective in language learning in general terms. It has positive effect on improvement of language skills, strengthen the attitudes and motivation of language learner and assists learner in interaction and collaboration of knowledge. [1]

No matter how well a technology is, there will be always the advantages and disadvantages that comes with the technology. The following is the advantages and disadvantages of mobile learning. [5]

2.3.1 Advantages of mobile learning

- Access lessons everywhere.
- Allows interaction with fellow students and instructors.
- Owning handhelds boosts motivation to learn.
- Learning materials are colorful and inviting.
- More affordable than larger system. E.g. deskstop.
- Flexible hours of learning.
- Can learn at our own pace.
- Saving of learning materials cost which normally bought in term of books.

2.3.2 Disadvantages of mobile learning

- Inconveniency of screen size causes learner's vision to be limited.
- Storage capacity is low on mobile phones and tablets.
- Short battery life which limited the usage of mobile devices.
- Platform varies and developers have hard time to make it useable by everyone.
- Mobile devices get outdated quickly.
- Incapability of printing materials or lessons learned.

2.4 Mobile learning technology and children

Nowadays, younger generation seems to be able to get hold of mobile technology easily. The reason why many children carries around mobile technology such as smart phones and tablet is because the convenience the technology offered. Some conveniences it offers are the ability to run an application which children can socialize with their families. Since children tend to need more attention than adults, social application such as Whatsapp allow children to socialize with their family when they are not around them. In term of security, mobile phone also provide GPS system just in case children are lost or separated by their family. And finally, the primary reason is that children can learn a lot with education applications that the technology offered.

Parents are considering these technology as another method of learning. We are heading towards where the world of *Free Agent Learners* "who seek out online learning resources on their own, follow a passion for a topic and fully explore it on the web, self-remediate when necessary, and are tapping into the power of educational games inside and outside of school". [3]

Table 1: Personal Access to Mobile Devices

Device	K-2	Gr 3-5	Gr 6-8	Gr 9-12
Cell phone (without internet access)	21%	29%	51%	56%
Smart phone	16%	19%	34%	44%
Laptop	37%	42%	60%	67%
MP3	37%	55%	79%	85%
Tablet device (iPad)	10%	8%	13%	10%

Figure 2.4: Shows the situation of children with the access of mobile technology in US in 2011. [3]

Mobile phone purchase for those ages 6 and above has raised by 40% in year 2010 in the US and globally 32%. Parents who are driving home from work, school, and running housework routines are using the mobile phone to entertain their children.

Children's mobile apps are being used for children to learn with their parents. The iPad and other tablets are changing our way and style in education due to its design and tactile user experience they provides in the classroom. The larger size of the tablet makes it easier to read text and look at the pictures better than your phone. [3]

2.5 Comparative study with existing products

There are many existing mobile application that is similar to this English to Local Malaysian Picture Dictionary. However, each have their own characteristics or functionalities to differ from one to another. Below are the table that differentiates between them.

Mobile App Features	**Giant Picture Dictionary**	**39 Language Picture Dictionary**	**Picture Dictionary With Speech Sound**
Multi-Language	Does not offer in multiple language	Offers 39 different international languages	Offers multiple language.
Local Language	Does not contain any local language such as Malay, Chinese and Tamil.	Does not contain any local language such as Malay, Chinese and Tamil.	Have local languages such as Malay, Chinese and Tamil.
Exercise Use	Does not offer any exercise use to user.	Does not offer any exercise use to user.	Provide the use of exercise to user.
Type of OS	Android	Android	Android
Word Pronunciation With Sound	Does not offer speech sound function	Does not offer speech sound function	Offer speech sound function

Table 2.5: Shows the differences of existing mobile picture dictionary application

Two example of picture dictionary application were taken for comparison. They were Giant Picture Dictionary and 39 Language Picture Dictionary.

In terms of language, Giant Picture Dictionary only offered in English while the other offered 39 language. Even though 39 Language Picture Dictionary offered 39 languages, none of the language offered are local such as Malay, Chinese and Tamil. In terms of exercise use, none of the existing offers exercise for children to do. Not only that, the application will be developed with a functionality to pronounce the sound of the word in multiple languages in which are not offered in existing application.

The only similarity that all three application will share is that they are developed in android platform. Reason to this is because of android operating system is more commonly used by the developer since android-based mobile phones are currently flooding the market.

CHAPTER 3

METHODOLOGY

3.1 Research Method

Since the development may need to be done quickly in short time, the standard system development life cycle is used. There are many methods that can be used. Some of them are known as spiral, fountain, and waterfall. However, the simple system development life cycle is used.

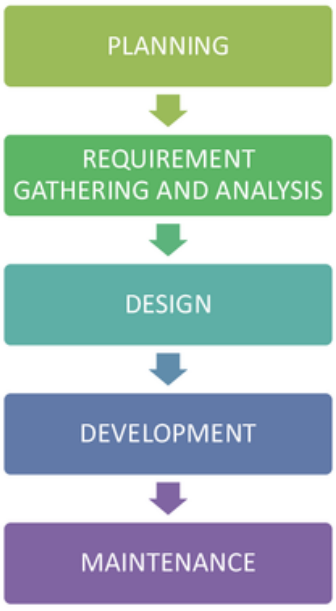


Figure 3.1: Shows the sequence of System Development Life Cycle [3]

The System Development Life Cycle consisted of many phases. The phases are planning, analysis, design, development, and maintenance.

3.1.1 Planning

This phase is mainly focus on thinking about how the application will be developed. Since the application is for mobile apps, anything related to methods of delivery, software, hardware, the programming language, type of requirements needed, and the platform are all chosen and considered.

3.1.2 Requirement Gathering and Analysis

The information required to develop the application are all will be gathered. Things such as the types of users, the age of users, the race, the location and all other important functionality such as to view the pictures and having the 4 language of objects name in the application.

3.1.2.1 Methods of Requirements Gathering

The methods that will be used to gather the requirements are:

1. Questionnaires

Distribute questionnaire to primary schools which are Sekolah Kebangsaan Tronoh and Sekolah Kebangsaan Seri Tronoh from standard 1 to standard 3 students to gather information about picture dictionary usage.

2. Observation

Observe the current trend of using smart phone and tablet in the society to gather more real life experience of mobile learning along with existing application that does similar functionalities.

3. Analyze Existing Application

Read and gather information about existing application in the internet and make an improvement.

3.1.3 Design

During this phase, the design of the application's interface will be created. The functionality and process flow of the application also will be drawn.

3.1.3.1 Use Case Diagram

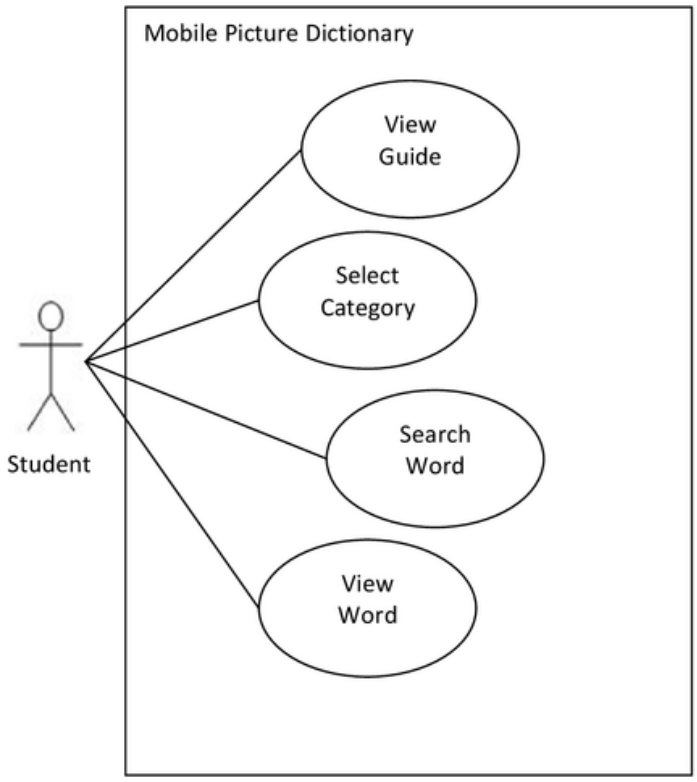


Figure 3.1.3.1: Shows the use case diagram for Picture Dictionary Mobile Application

The diagram above shows the functionalities of what user can perform with the mobile picture dictionary application. User can view the guide which teach new user on how to use the application. Not only that, user can select the category and perform a search on what word they are looking for based on the category. Once searched, they can view the word and play the sound of the texts in multiple language.

3.1.3.2 Activity Diagram

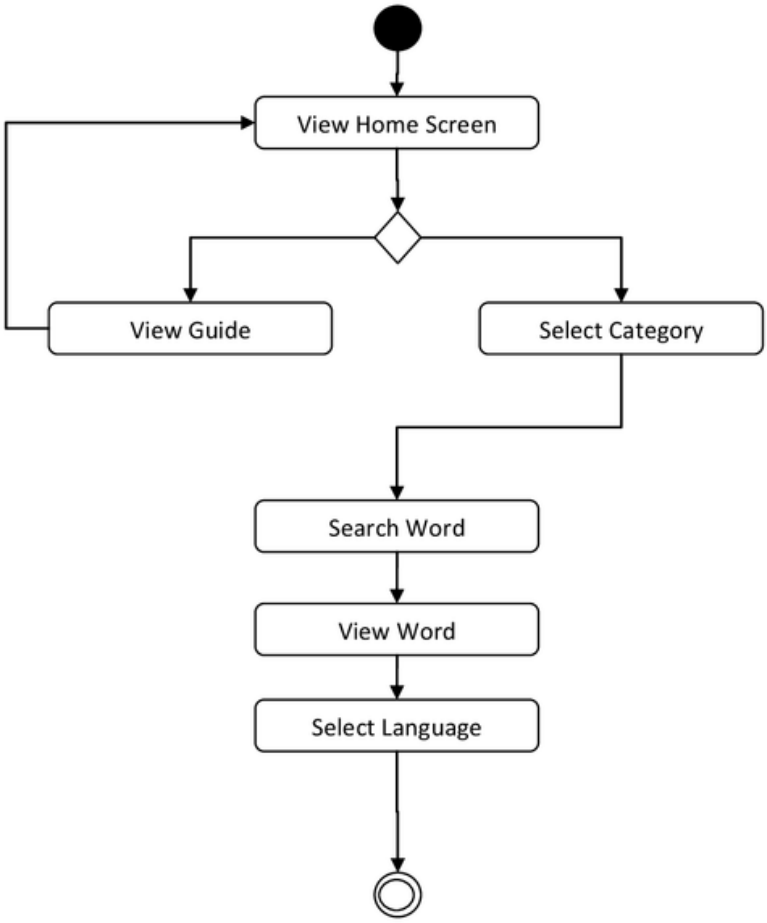
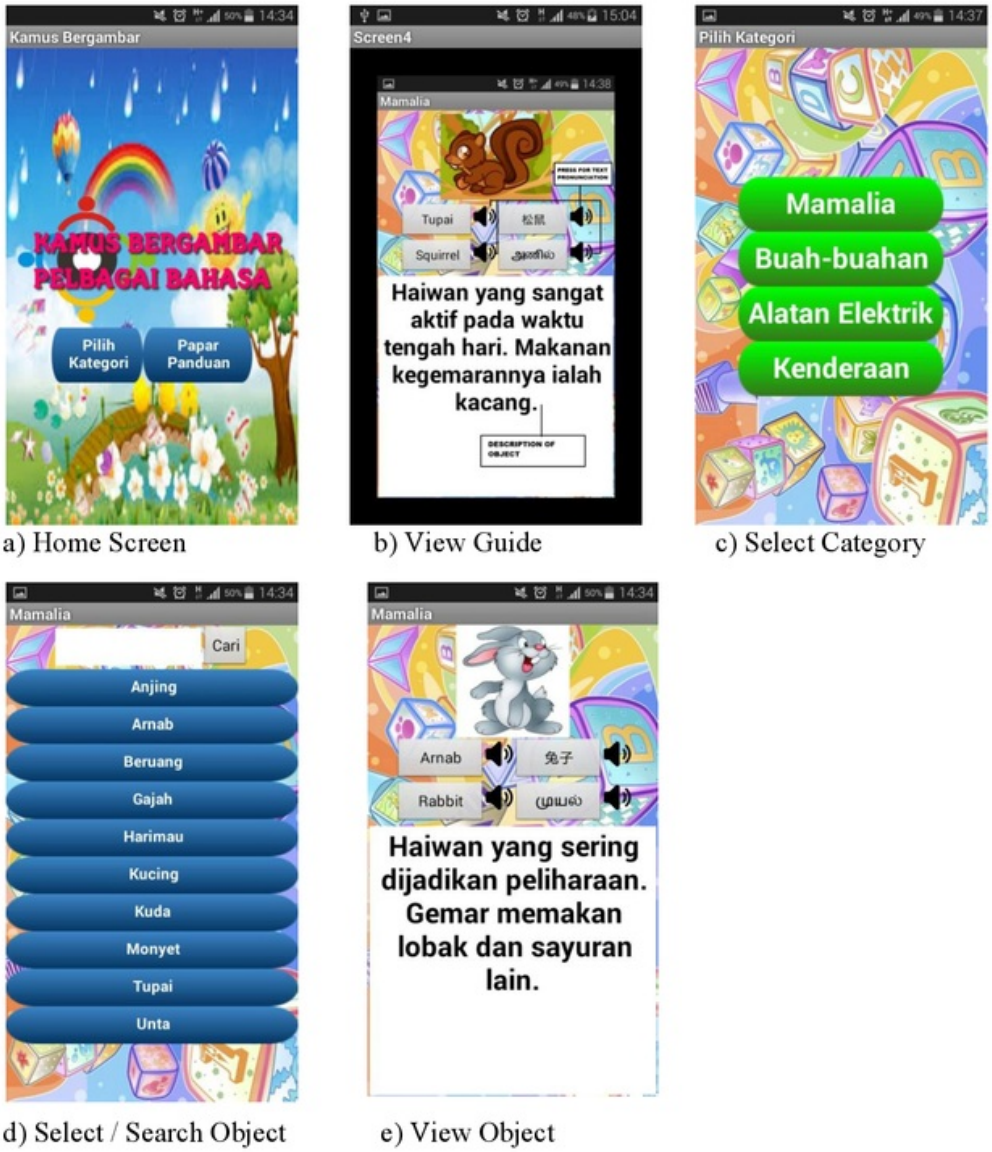


Figure 3.1.3.2: Shows the activity diagram for Mobile Picture Dictionary

The diagram above shows the activities involved in using the mobile picture dictionary application. When running the mobile application, the user first will be brought to the home screen. The user will have the option to select category of the dictionary or to view the guide. Once the select category is selected, the user will have the option to search the word in the category or perform an exercise based on the category chosen. Viewing the word will display the picture and multiple languages will be shown.

3.1.3.3 Interface Design



a) Home Screen b) View Guide c) Select Category

d) Select / Search Object e) View Object

Figure 3.1.3.3: Shows the user interface for Mobile Picture Dictionary

a) Home Screen- Which users can select whether to choose the category or view the guide to learn how to use the application.

b) View Guide - This is where user can see the guide which can help user on how to use the application.

c) Select Category - User can select which category they want to search for the object's name.

d) Select / Search Object - User can select or search the name of the object in the dictionary.

e) View Object - This is the view of the object's picture and their name in other languages.

3.1.4 Development

In this phase, the application will be developed. The tools used is MIT App Inventor to program the application. The development will be based on all the requirements and information gathered in the analysis phase.

The software and hardware required will be as follows:

Hardware used for the development.

Mobile Device	Mobile Phone or Tablet
Operating System	Windows 7, Windows 8
Processor	Intell Core i5-3570k
Memory	8G RAM
Peripherals	Mouse, Keyboard, Printer, Speaker,

Table 3.1.4.1 Hardware used for the development

Software used for the development.

Mobile OS	Android
Development Software	MIT App Inventor

Table 3.1.4.2 Software used for the development

3.1.5 Maintenance

In this phase, the application will be tested. Any errors found will be fixed. Some of the errors found could be translation error, image compatibility and other coding related errors. User acceptance testing were also done to gather feedbacks.

3.2 System Flowchart

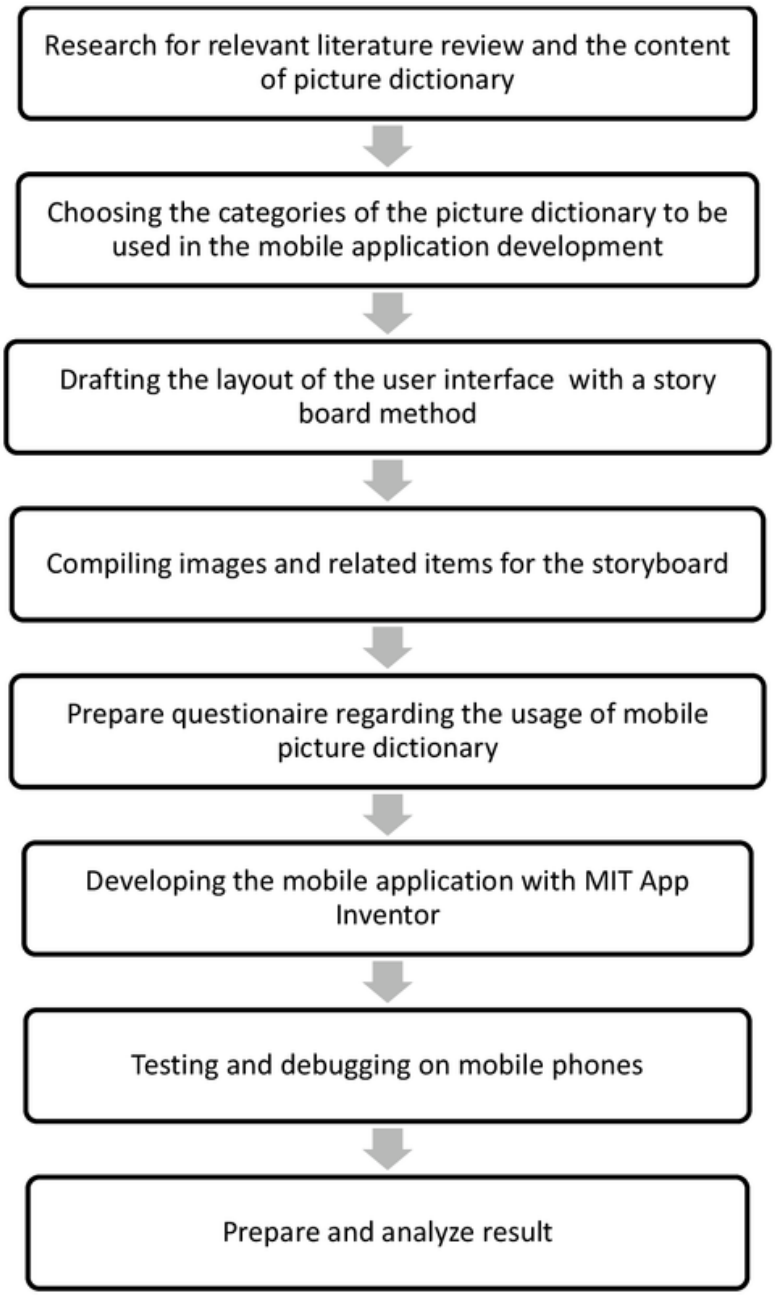


Figure 3.2: System Flowchart

3.3 Project Activities

For this mobile application development, it will be progressing as planned in the Gantt chart for FYP1 and FYP2. For the FYP1, the main activities will be carried out will include gathering all possible materials such as the content of the picture dictionary, relevant categories. Secondly, there would be a rough sketch of the user interface that is going to be used for the application. For FYP II, it is more to develop the application using various kinds of software, the materials needed and testing the application.

3.4 Key Milestone

For FYP 1, the content and categories of the picture dictionary will be chosen and compiled and waiting to be inserted into the mobile application. For FYP2, it will be fully developed with all the relevant details and a working application is generated.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 System Design

Figure 4.1.1 shows the application icon for the picture dictionary mobile application highlighted in red line.

Figure 4.1.1 Mobile Picture Dictionary Application Icon

Figure 4.1.2 shows the content of the mobile picture dictionary application. The dictionary is consisted of four categories which are mammals, vehicles, fruits and electronics. Each category has numbers of objects able to viewed.

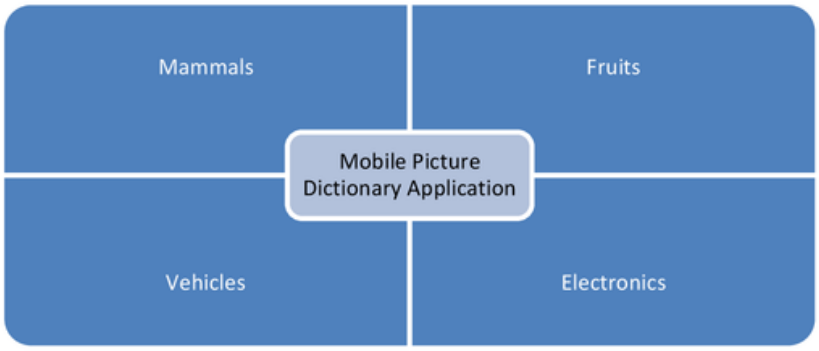


Figure 4.1.2: Content of Mobile Picture Dictionary Application

4.2 Data Gathering and Analysis

The target questionnaire respondents are standard three primary school students who often use picture dictionary in their learning process. The objective of this interview is to analyze the importance, usage and reliability of picture dictionary mobile application in primary schools.

Fifty questionnaires were distributed to primary schools which are Sekolah Kebangsaan Tronoh and Sekolah Kebangsaan Seri Tronoh. Each school were given twenty-five questionnaires to be filled out by the standard three students randomly every class.

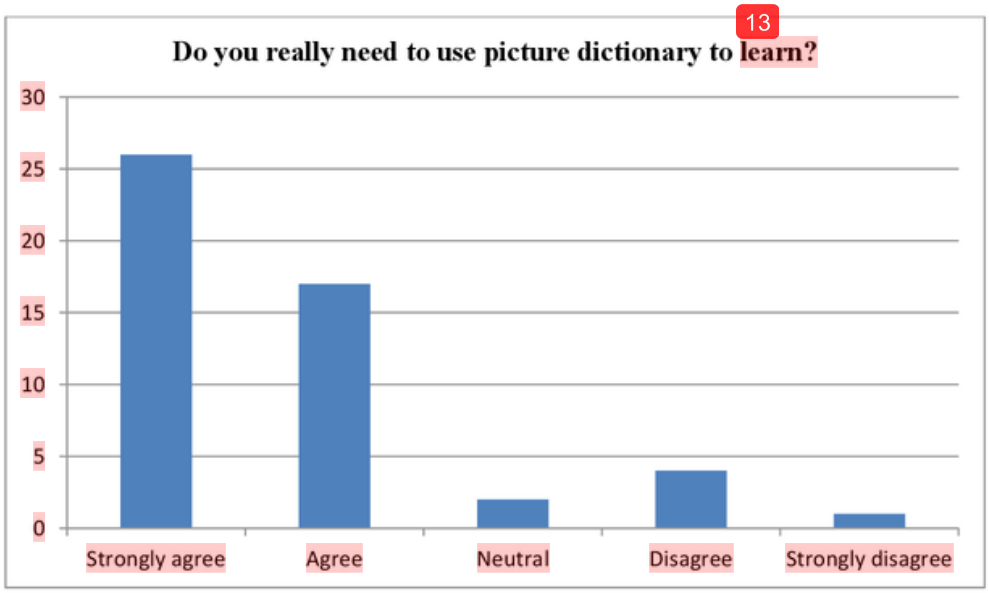


Figure 4.2.1 : Do you really need to use picture dictionary to learn?

Based on the figure 4.2.1 previously , more than 80% of the student agree that they need to use the picture dictionary to learn. The rest are either neutral or disagree. This has been proven to be true since picture dictionary has been crucial part of primary schools learning. From time to time, teachers may ask their students to take out their picture dictionary during class session. Picture dictionary has been acting as the reference for primary school students to aid them to conduct many learning activities.

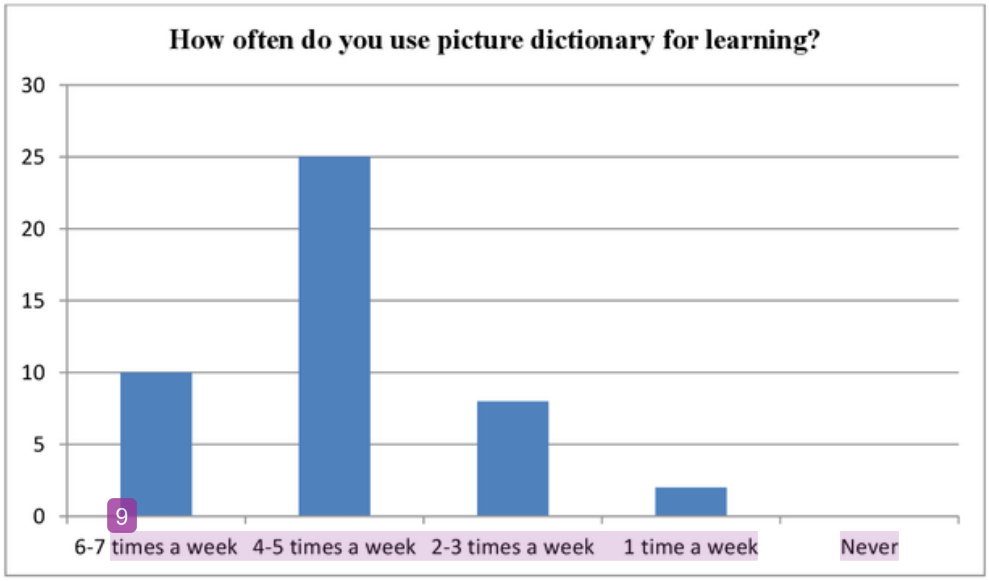


Figure 4.2.2 : How often do you use picture dictionary for learning?

Based on the figure 4.2.2 above, more than 70% of the students use dictionary for learning almost every day. 16% rarely use it every week. From this figure, we can assume that teachers and students from Sekolah Kebangsaan Tronoh and Sekolah Kebangsaan Sri Tronoh has been putting picture dictionary as crucial learning tools for their learning process. This shows that picture dictionary is greatly useful for students to learn and finish their homework.

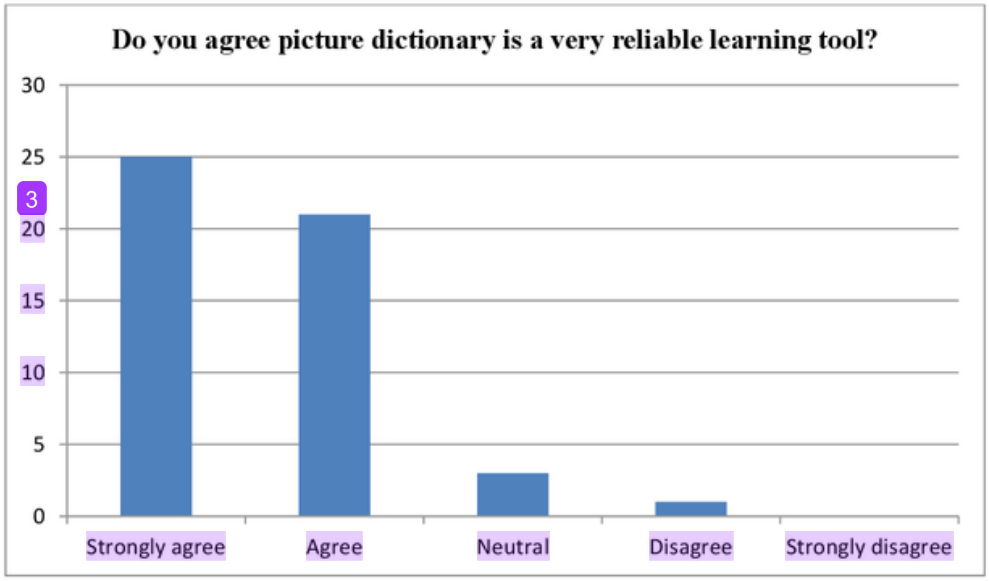


Figure 4.2.3 : Do you agree picture dictionary is a very reliable learning tool?

Based on figure 4.2.3 above, more than 90% of the student agree that picture dictionary is a very reliable learning tool. The rest is neutral and only one disagree of this case. The picture dictionary has proven that picture dictionary really helped students in their learning process. Most primary school students of Sekolah Kebangsaan Tronoh and Sekolah Kebangsaan Seri Tronoh find it very realiable when they want to do their class work and homework.

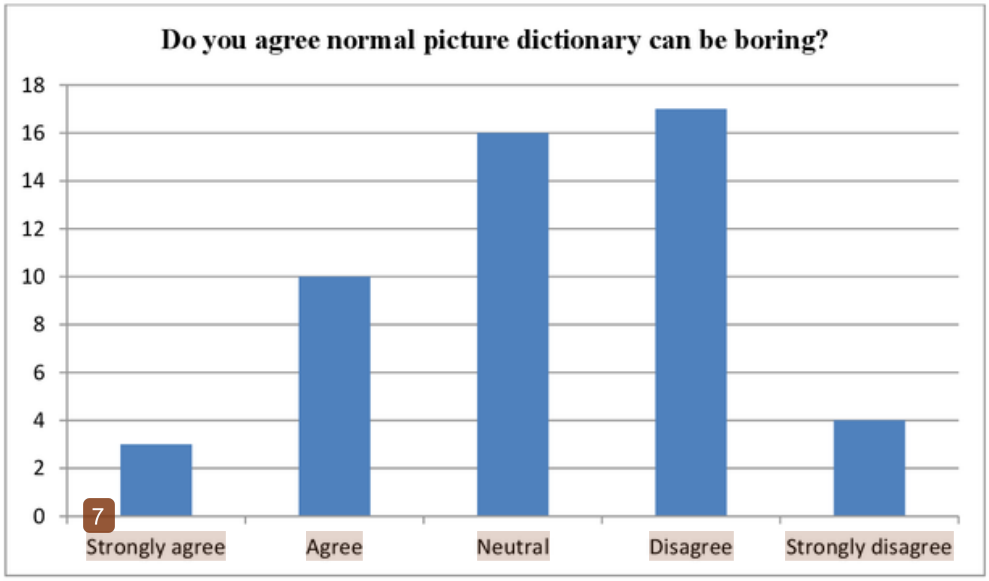


Figure 4.2.4 : Do you agree normal picture dictionary can be boring?

Based on the figure 4.2.4 above, 42% of the student disagree normal picture dictionary is boring. 32% of the student are neutral of this case. While 26% of the students agree it is boring. This has proven that more students disagree that picture dictionary is boring. From this statistics, we can assume that pictures in the picture dictionary really attracted their attention and boosts their willingness to learn in school and at home. Having them interested in the picture may also boost their memory in learning the name of the objects in different language shown in the picture dictionary.

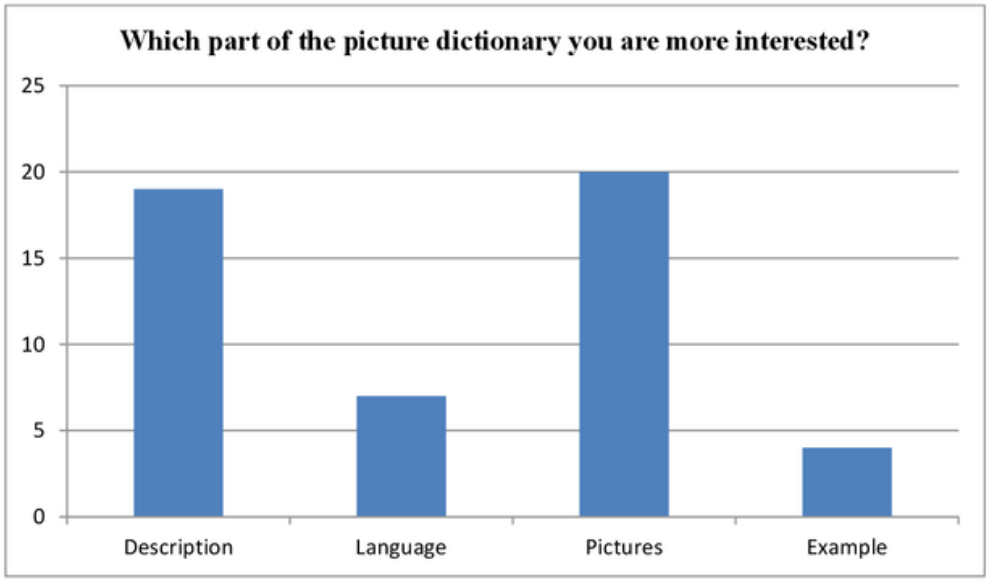


Figure 4.2.5 : Which part of the picture dictionary you are more interested?

Based on the figure 4.2.5 above, 38% of the student love the description of the objects in the picture dictionary. 40% of the students are more interested on the pictures. 14% like the languages and 8% loves example of sentence using the word. This shows that more students are interested in pictures and descriptions of the object shown in the picture dictionary. Things such as appearance which includes the size, color and shape of the object really made it caught the attention of primary school students. Not only that, description of the object caught the interest of students since young children usually are curious and they really want to know what the object can do, where the object can be found and how do the object is relevant in their life.

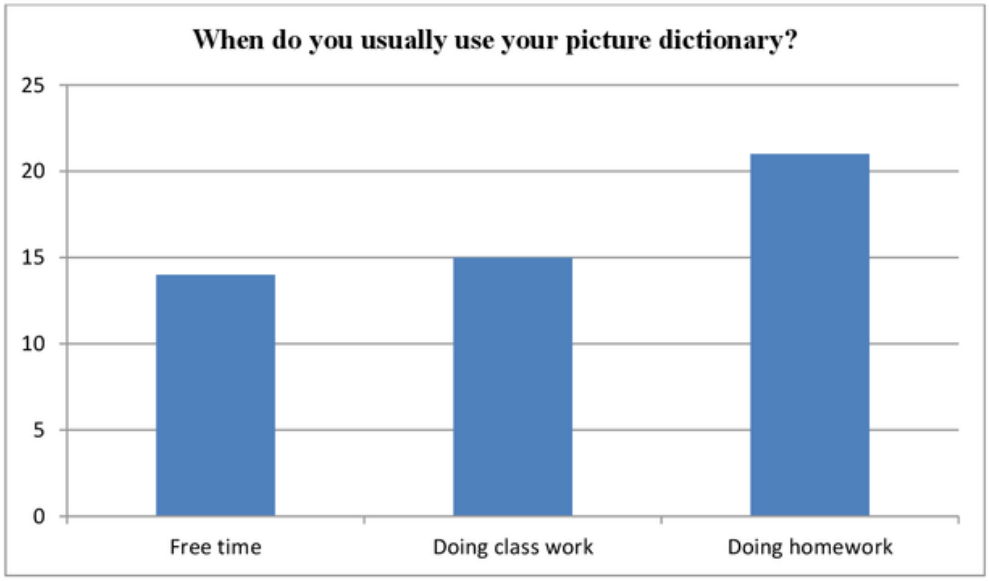


Figure 4.2.6 : When do you usually use your picture dictionary?

Based on the figure 4.2.6 above, 42% of the student use the picture dictionary for home work. 30% of the students use it for class work while the rest use it during free time. From this statistic, we can assume that students enjoy doing homework with the aid of picture dictionary. The picture dictionary can be use as the guidance for the primary school students to do home works such constructing sentence based on pictures given, describing the object in English or other local language and as the vocabulary learning activities. Not only that, the primary school students also use picture dictionary to aid them to do their class room activities. From time to time, we can say that the primary school students read the picture dictionary to fill their free time. This shows that some primary school students really love to explore and learn new things through pictures just to fill their curiosity.

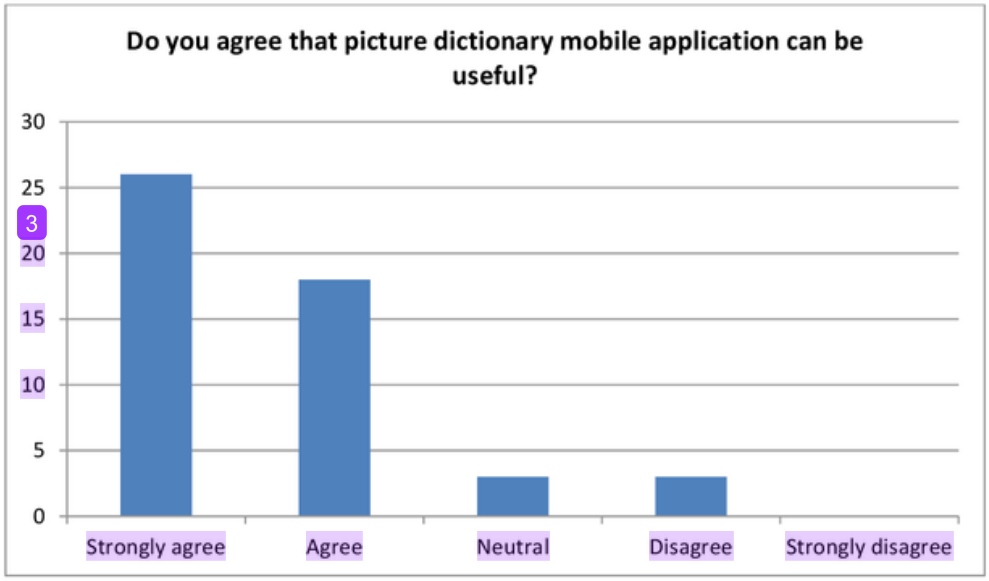


Figure 4.2.7: Do you agree that picture dictionary mobile application can be useful?

Based on the figure 4.2.7 above, more than 85% of the student agree that mobile application picture dictionary is useful. While the rest of them are either neutral or disagree. From this statistic, we can assume that the use of technology with picture dictionary is really needed by the primary school students. Ordinary picture dictionary may have certain flaws that hinders the primary school students from carrying out their learning process. Problem such as the high effort to turn the page one by one to search the objects they needed to know could be one of the reasons why many primary school students agree that picture dictionary should be in mobile application form. Many students may know that mobile application may provide many functionalities that ease their quality of life in using picture dictionary.

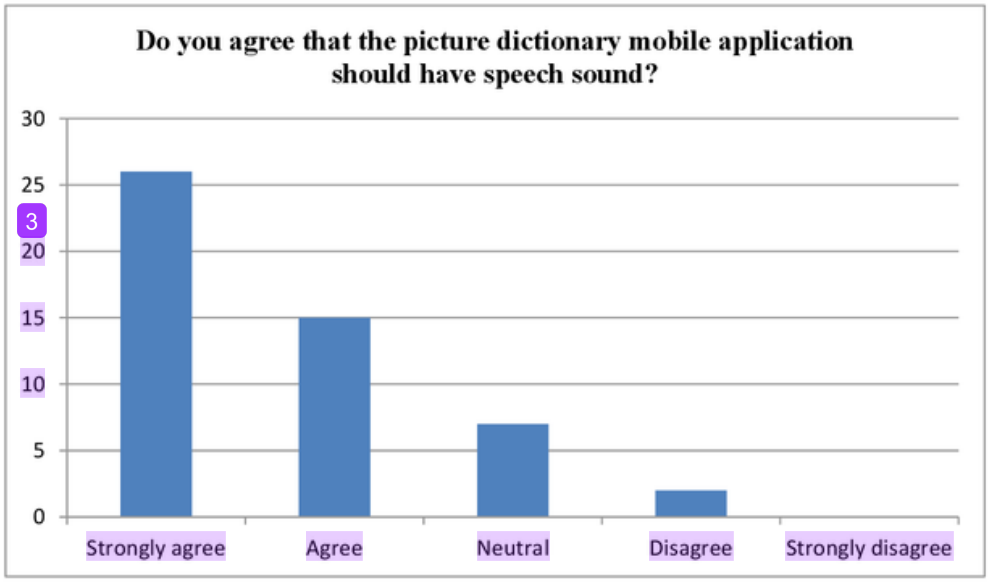


Figure 4.2.8: Do you agree that the picture dictionary mobile application should have speech sound?

Based on the figure 4.2.8 above, about 82% of the students agree the application should have speech sound. 14% are neutral and 4% disagree. This statistic showed us that the use of speech sound is really needed by the students. This could be either the fact that students find it interesting when picture dictionary also provide speech sound or it can further assist students to learn on how to spell the name of the objects in other language. Either way, it could motivates the primary school students to use picture dictionary more.

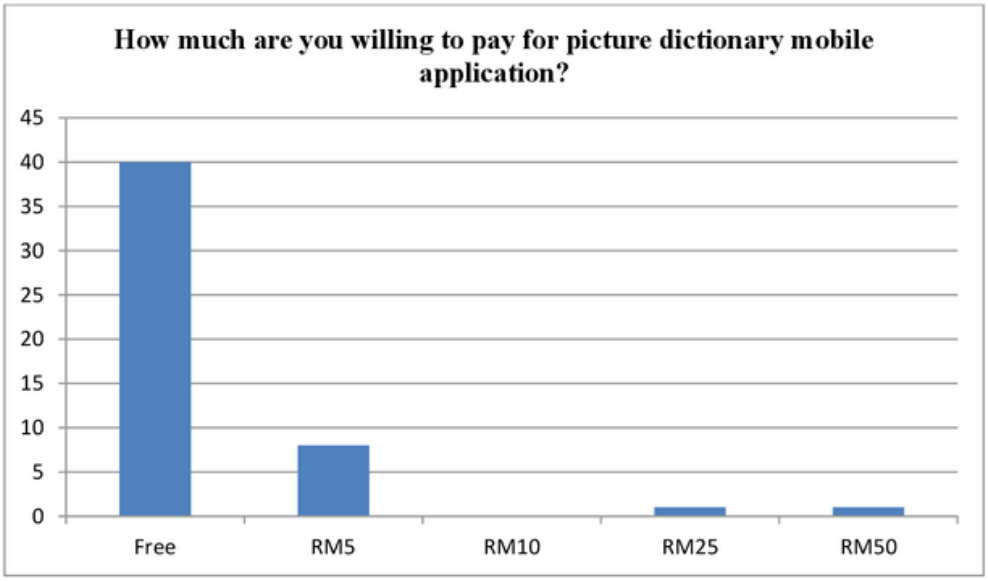


Figure 4.2.9: How much are you willing to pay for such application?

Based on the figure 4.2.9 above, 80% of the students think that the mobile application should be free. 16% think it should be sold at RM5. The rest think it should be sold at RM25 or RM50. From this statistic, we could make an assumption that students would rather not spend any money using the picture dictionary. This is acceptable since many new applications are free to use by anyone that wants to get involved in mobile learning. Not only that, young children also would not have enough money to buy the application on their own although it may prove useful to them.

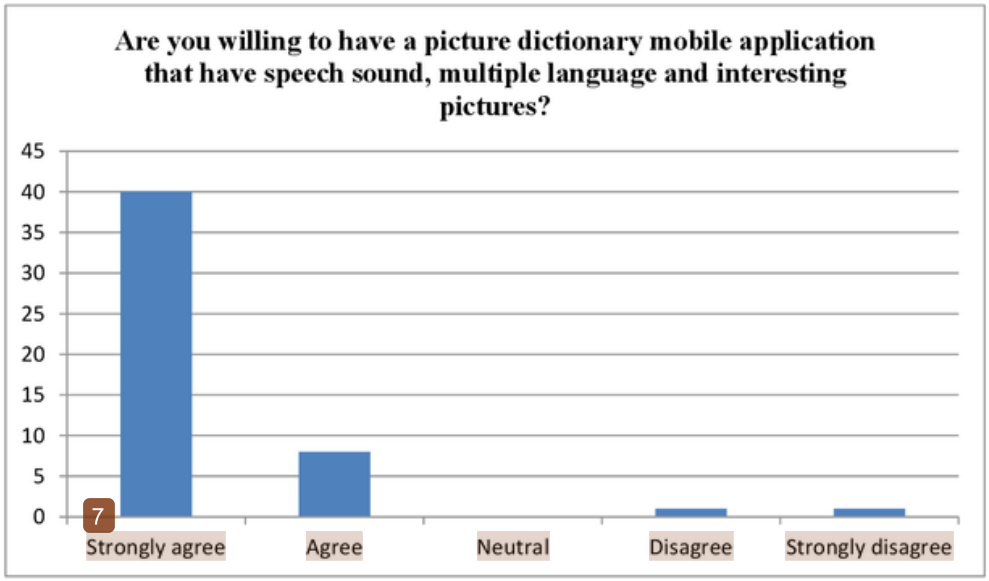


Figure 4.2.10: Are you willing to have a picture dictionary mobile application that have speech sound, multiple language and interesting pictures?

Based on the figure 4.2.10 above, 96% of the students are willing to have the mobile application which consist of speech sound function, offers multiple language with an interesting picture. From this statistic, we can see that most primary school students of Sekolah Kebangsaan Tronoh and Sekolah Kebangsaan Seri Tronoh find the mobile application useful and really want to have them. The use of speech sound may help them greatly in their learning process especially verbal speech. Not only that, multiple language offered by the picture dictionary may also assist students who are learning local languages such as Chinese and Tamil. These prove that picture dictionary mobile application with speech sound is a good application to be developed.

4.3 User Acceptance Testing

A total of 10 primary school students were asked to test the application. The primary school students were asked to fill out the form which ask the users the level of attractiveness, usability and the capability of the application to aid the primary school students learn local languages. The results of the testing are shown in figure 4.3.

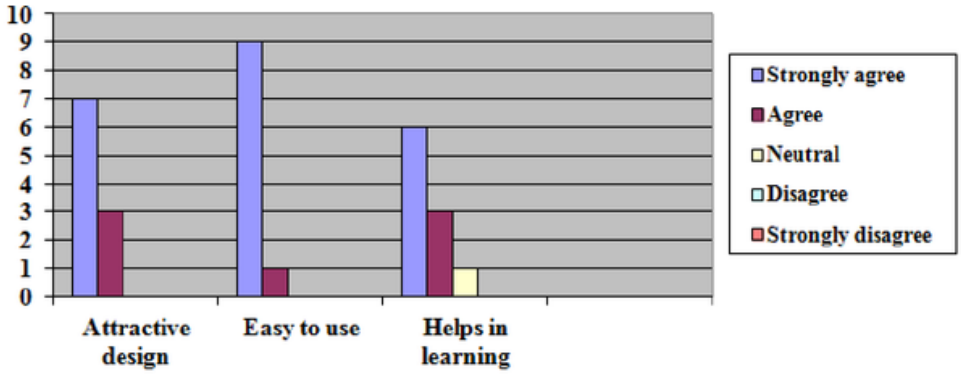


Figure 4.3: User Acceptance Results

4.4 Discussion

A total of fifty questionnaire forms were distributed to Sekolah Kebangsaan Tronoh and Sekolah Kebangsaan Seri Tronoh for standard three students. Based on the data gathered, it is very convincing that students are really interested in having a picture dictionary mobile application. Picture dictionary has been a very important tool in learning process.

The usage of picture dictionary is very often. This can be seen since they frequently need to use picture dictionary in class session in schools. From time to time, teachers may ask students to do activities such as to construct sentences describing an object in English. Students will have to take out their picture dictionary to help them to find the objects to construct the sentences needed. Not only that, students are also using the picture dictionary as an aid in doing homework at home. Home is a great place

for students to learn since they can also ask their parents for help. With the aid of picture dictionary, they can figure out to finish their homework together.

There are also students who enjoy reading picture dictionary during their free time. Sometimes, when they are bored, they will find something to read to fill their free time. They tend to love in discovering new things through pictures. There are variety of imaginations and possibilities of discovering and learning new things especially through pictures. This is the reason why more students are interested in pictures and the description of it. They would like to think the object's features and what does it looks like.

The students are also interested in the speech sound. It will really help them if there is a voice which reads the name of the object. They are willing to know on how to call the object's name. Sometimes, students are having problem in pronouncing an object's name in other language since it is not their native's. Thus, having a functionality where student can ask the application to say the name of the object right can really help them in oral assessment in school.

Since they are just primary school students, they are willing to have the applications for free. However, some students are also willing pay RM5 for the mobile application. The price is very reasonable since the application is tailored for younger children. Their parents might willing to pay for this application due to its functionalities

Understanding the results of the questionnaire, it is a great idea to develop the picture dictionary mobile application. Picture dictionary has been a great tool in aiding teachers and student in their learning session. Having some functionalities such as multiple language, speech sound and offering exercises to students may greatly help in their studies and learning process.

User acceptance testing were done in order to get the feedback of the primary school students who are using the application. Result shows that the application is indeed attractive, very easy to use and really helps the primary school students in learning other local languages.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

At the earliest phase of the project, most of the activities performed were to determine what is picture dictionary and its importance in learning. Conducting the research about the use of picture dictionary really helps in determining whether picture dictionary mobile application is really needed by primary students. The main objective of this project is to develop an application which can help in assisting primary school students in learning objects in multiple local languages such as Malay, English, Chinese and Tamil.

Developing a mobile picture dictionary will surely help students in their learning process. There are lots of functionalities the picture dictionary mobile application will have compared to ordinary ones. Those functionalities will be speech sound system which can teach student on how to pronounce certain words correctly. Not only that, it can also offer search function where students can just search through with few key presses as compared to traditional turning the pages one by one. Lastly, it also offer exercise which students can do to enhance their language skills.

The operating system for the application is developed in android environment. Pictures in the picture dictionary mobile application are extracted from the picture dictionary bought from the store and from the internet. The application is integrated with a text to speech application program interface to allow the application to pronounce the name of the object and the search functionality. The categories of the dictionary are including mammals, fruits, vehicles, and electronics.

5.2 Recommendations

For improvements and enhancements, the application should be able to display animated gifs. Animated gifs can be more attractive to children when compared to static pictures. Although current technology does not seem to allow the implementation of animated gifs easily, future developers may find it easy in the future when newer and easier development tools been introduced.

The application can be further improved with the functionalities where students can add their own content, pictures, vocabulary, words and object into the application. This can be really helpful when object categories such as vehicles may have new vehicles been invented in the future.

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APPENDICES

Appendix 1: Questionnaire

Question	6-7 times a week	4-5 times a week	2-3 times a week	1 time a week	Never
How often do you use picture dictionary?					

Question	Description	Language	Pictures	Example
Which part of the picture dictionary you are more interested?				

Question	Free time	Doing class work	Doing homework
When do you usually use your picture dictionary?			

Question	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Do you really need to use picture dictionary to learn?					
Do you agree picture dictionary is a very reliable learning tool?					
Do you agree normal picture dictionary can be					

boring?					
Do you agree that picture dictionary mobile application can be useful?					
Do you agree that the picture dictionary mobile application should have speech sound?					
Are you willing to have a picture dictionary mobile application that have speech sound, multiple language and interesting pictures?					

Question	Free	RM5	RM10	RM25	RM50
How much are you willing to pay for such application?					

Appendix 2: Gantt Chart for Final Year Project I

Activities Weeks	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14
1. Planning Phase														
1.1 Problem identification														
1.2 Background of study														
1.3 Literature review														
2. Requirement Gathering and Analysis														
2.1 Preparation of questionnaire														
2.2 Research and data gathering at schools														
2.3 Tabulation of data														
2.4 Results and discussion														
2.5 Requirement gathering														
3. Design Phase														
3.1 Use case diagram														
3.2 Activity diagram														
3.3 Interface design														

Appendix 3: Gantt Chart for Final Year Project II

Activities Weeks	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14
1. Development Phase														
1.1 User Interface														
1.2 System Interface														
1.3 Coding														
2. Maintenance Phase														
2.1 Testing														
2.2 Debugging														

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